

EL 201 : ELECTRONIC CIRCUITS I

CREDITS : 5 (L = 4, P = 2)

1. Diodes : Derivation of the characteristic equation of a p-n junction diode. Temperature dependence of diode characteristics. Diode resistance and capacitance. Switching times.
2. Filters : Analysis of ripple voltage and ripple factor of LC, CLC (pi type) and RC filters. Design considerations. Voltage multiplying circuits. Simple shunt and series regulators.
3. Bipolar junction transistors : Construction. Transistor current components. Derivation of generalized transistor equations. Analysis of a transistor in CB, CE and CC configurations. The Ebers-Moll model. Ratings of transistors. Photovoltaic effect, photo-diodes, and phototransistors.
4. Transistor biasing : Fixed bias and emitter bias, Stabilization of Q-point against variations in I_{co} , V_{be} and β . Bias compensation.
5. Small-signal amplifiers . h parameters : Mid-frequency analysis of a single-stage amplifier, in CB, CE and CC configurations. Voltage gain, current gain, power gain, input impedance and output impedance. The Darlington pair.
6. Field effect transistors : JFETs and MOSFETs. Construction. Static and transfer characteristics. Biasing. Analysis of FET amplifiers using small-signal mid-frequency model.
7. Operational amplifiers : Characteristics of an ideal operational amplifier. Differential amplifier and CMRR. Study of an IC operational amplifier. Operational amplifier used as a.c. and d.c. amplifier, sinusoidal oscillator, analog computing element, clipper, and zero-crossing detector

REFERENCE BOOKS :

1. *Millman and Halkias*
Integrated Electronics
McGraw-Hill International
2. *K. V. Ramanan*
Functional Electronics
Tata McGraw-Hill